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ABSTRACT

Two instruments have been developed to aid teachers and other educators in evaluating educational software and courseware: the "Courseware Description" form and the "Courseware Evaluation" form. Complete instructions for using both forms are provided in this guide, along with the forms themselves. Prior to the instructions is an introductory section explaining the purpose of the guide, describing the four-stage evaluation process (sifting, description, peer review, and indepth evaluation), and providing a basic definition of terms. The instructions themselves include thorough explanations of each descriptive and rating criterion on the two forms. Then five sample reviews are provided for the following courseware: "Bumble Plot" (elementary mathematics), "Word Games" (spelling), "Krell's College Board SAT" (test preparation), "Three Mile Island" (physical science), and "Dragon Mix" (elementary mathematics). A list of International Council for Computers in Education (ICCE) member organizations is provided on the inside back cover. (TE)

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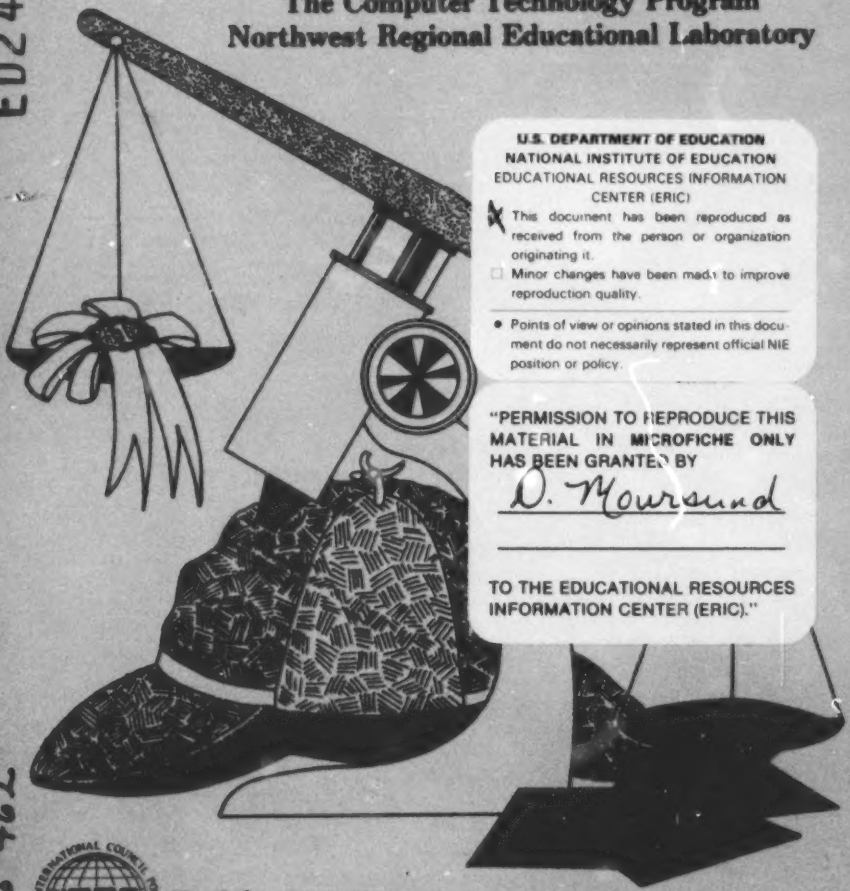
# Evaluator's Guide
## For Microcomputer-Based Instructional Packages

ED240699

Developed by MicroSIFT
a project of
The Computer Technology Program
Northwest Regional Educational Laboratory



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The International Council for Computers in Education is a non-profit, tax exempt corporation dedicated to improved instructional use of computers. It publishes *The Computing Teacher*, an international journal that focuses upon instructional uses of computers at the pre-college level.

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International Council for Computers in Education
University of Oregon
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Eugene, Oregon 97403

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National Institute of Education
**Dr. Richard Otte, Project Monitor**

Division of Evaluation, Research and Assessment, NWREL
**Dr. Nick Smith, Director, Research on Evaluation Program**
**Dr. Gabriel Della-Piana, Consultant**
**Tom Eucker, Intern**
**Penny McDonald, Intern**

Computer Technology Program, NWREL
**Dr. Judith Edwards-Allen, former Director, Computer Technology Program**
**Donald Holznagel, Director, Computer Technology Program**
**Jerilyn Marler, Editor**
**Nancy Allen, Consultant**
**Dr. Robert Woolley, Consultant**
**Dr. Dan Isaacson, Consultant**

Inquiries regarding the development of this booklet or the project may be directed to Dave Weaver, MicroSIFT, Computer Technology Program, Northwest Regional Educational Laboratory, 300 S.W. 6th Ave., Portland, Oregon 97204, (503) 248-6800.

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Some editing and changes in format were done by ICCE for the January 1982 edition. Second Printing, July 1982. The Description and Evaluation forms were revised in November 1982, as a result of a year's experience. The *Evaluator's Guide* was revised accordingly in January 1983. Third Printing, February 1983. Fourth Printing, November, 1983.

## SIFTnet

The MicroSIFT Network, SIFTnet, is a group of over 25 educational organizations serving elementary and secondary schools with computer services and other types of support. SIFTnet was formed during 1980-81 to be the major vehicle for the evaluation process and the source of reviewers and test sites. An asterisk (*) indicates that the field test of the *Guide* and the evaluation process were performed by staff members at those institutions and their constituent school districts. The field test also included faculty and students of Utah State University, Logan, Utah.

Pilot tests of early versions were completed with the assistance of personnel from Beaverton School District, Beaverton, Oregon and the Portland Public Schools, Portland, Oregon.

**ALASKA DEPARTMENT OF EDUCATION**
Ed Obie
Department of Planning
Alaska Department of Education
Pouch F, Alaska Off. Bldg.
Juneau, AL 99811

**AREA COOPERATIVE EDUCATIONAL SERVICES**
Kathryn Smith
ACES Computer Services
205 Skiff Street
Hamden, CT 06517

**CAPITOL CHILDREN'S MUSEUM**
Bob Evans
800 Third St. N.E.
Washington, D.C. 20002

***CLACKAMAS ESD**
Jerry Larer
No. Clackamas School Dist.
14211 S.E. Johnson Road
Milwaukie, OR 97222

**COOPERATIVE EDUCATIONAL SERVICES**
Ed Montagnino
Cooperative Educational Services
P.O. Box 2087
Norwalk, CT 06856

**CONNECTICUT DEPT. OF EDUCATION**
Betty Glass
Connecticut Dept. of Education
P.O. Box 2219
Hartford, CT 06115

**DEPT. OF DEFENSE DEPENDENTS SCHOOLS**
Dennis Bybee
Office of Dependent Schools
2461 Eisenhower Avenue
Alexandria, VA 22331

**EAST CENTRAL NETWORK FOR CURRICULUM COORDINATION**
Rebecca S. Douglas
Illinois Vocational Curriculum Center
Sangamon University E-22
Springfield, IL 62708

**FLORIDA DEPT. OF EDUCATION**
Pristen Bird
Educational Technology Section
Florida Dept. of Education
109 Knott Building
Tallahassee, FL 32301

***INSTITUTE FOR EDUCATIONAL RESEARCH**
Sandra Cunningham
IER
793 N. Main St.
Glenn Ellyn, IL 60137

**IOWA REGIONAL COMPUTER CONSORTIUM**
Doug Archer
Green Valley AEA 14
Green Valley Road
Creston, IA 50801

***JEFFERSON COUNTY SCHOOLS**
Jan Byber
Jefferson County Schools
1209 Quail Street
Lakewood, CO 80215

**LEHIGH UNIVERSITY**
Leroy Tuscher
Educational Technology Program
Lehigh University
524 Brodhead Ave.
Bethlehem, PA 18018

***MINNESOTA EDUCATIONAL COMPUTING CONSORTIUM**
Kent Kehrberg
MECC
2520 Broadway Drive
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TIES
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Roseville, MN 55113

**MONTGOMERY COUNTY PUBLIC SCHOOLS**
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850 Hungerford Drive
Rockville, MD 20850

**MULTNOMAH COUNTY ESD**
Dawn Carner
Multnomah County ESD
P.O. Box 16657
Portland, OR 97216

**OREGON TOTAL INFORMATION SYSTEM**
Ben Jones
OTIS
1200 Hwy. 99N
Eugene, OR 97402

**PROGRAM OF RESEARCH AND EVALUATION FOR PUBLIC SCHOOLS**
Thomas A. Satterlee
PREPS
P.O. Box 5365
Mississippi State, MS 39762

***REGION IV ESC**
Marilyn Fricks
Region IV ESC
P.O. Box 863
Houston, TX 77001

***REGION X ESC**
Tommy Wade
Region X ESC
P.O. Box 1300
Richardson, TX 75080

***SAN MATEO EDUCATIONAL RESOURCE CENTER**
Ann Lathrop
SMERC Library/Microcomputer Center
333 Main St.
Redwood City, CA 94063

**TRI-COUNTY CONSORTIUM:**

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Macomb ISD
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Mt. Clemens, MI 48043

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Tom Schmeltzer
Oakland ISD
2100 Lake Road
Pontiac, MI 48054

**WAYNE ISD**
Lary Smith
Wayne ISD
33500 Van Born Road
Wayne, MI 48184

**UNIVERSITY OF IOWA CEEDE**
Dr. Lawrence Stolurow
218 Lindquist Center
Iowa City, IA 52242

**WEST LAFAYETTE SCHOOL CORP.**
Dave McGaw
West Lafayette High School
West Lafayette, IN 47906

## Resources in Computer Education
## RICE

MicroSIFT reviews are in the RICE data base of information about microcomputer courseware for use in elementary and secondary education. Bibliographic citations are included for packages that have also been evaluated by other agencies or publications. RICE also contains information on some 2,000 microcomputer courseware items as well as information about commercial and noncommercial producers of computer-based instructional and administrative software.

RICE was developed by the Northwest Regional Educational Laboratory's Computer Technology Program with support from the National Institute of Education. The data base is installed on the BRS (Bibliographic Retrieval Services) national computer network. It can be searched using ERIC procedures and descriptors such as grade level, required hardware, instructional purpose (remediation, standard instruction or enrichment), and instructional techniques (drill and practice, tutorial, simulation, etc.).

For information on conducting a search of the RICE data base contact Barbara Rozell, Coordinator of the NWREL Technology Center for Demonstration and Training (1-800-547-6339, ext. 521 from outside Oregon; 248-6800, ext. 521 in Oregon).

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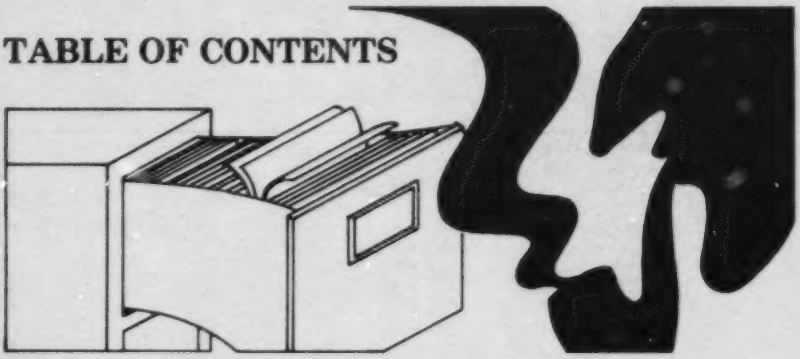

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ICCE is pleased to publish the *Evaluator's Guide*, a tool for writing carefully documented, thorough software reviews. It is particularly useful for preservice and inservice students, practitioners, software developers and users of software reviews.

**Students:**

This *Guide* provides a structure for learning how to evaluate and select educational courseware. Through the experience gained in preparing detailed software evaluations, students will increase their awareness of what to look for in high-quality courseware, which will reinforce their knowledge of sound teaching practices.

**Practitioners:**

The need for careful evaluation increases as the amount of money spent on courseware increases. The quality of courseware is improving and competition is becoming more intense. Decisions are harder to make and the need to justify those decisions is growing. The *Evaluator's Guide* provides an organized, structured format for evaluating and selecting courseware to implement curriculum.

Teachers who utilize courseware can benefit from the *Guide* by using the information to take advantage of a package's strengths while working around its weaknesses.

**Software Developers:**

The *Evaluator's Guide* gives people who are writing or revising software a checklist to judge the instructional worth of their courseware. They can use the *Guide* as they consider the problem, design the courseware, code, write the documentation, and field test the package.

**Users of Software Reviews:**

Teachers can put a high degree of trust in a MicroSIFT review. Having the *Guide* available provides the justification for that trust and allows the user to clarify the criteria used in specific sections when needed.

Educators using the *Evaluator's Guide* will become more knowledgeable and discriminating when selecting courseware. This will encourage developers to continue to raise the quality of their courseware.

# I. INTRODUCTION

## PURPOSE

Except in instructional situations where student programming is the primary activity, microcomputers can assist the instructional process effectively only to the extent that quality software is available.

This *Evaluator's Guide* has been developed to provide background information and forms to aid teachers and other educators in evaluating educational software and courseware. The *Courseware Description* form and *Courseware Evaluation* form are described.

The forms were based on those developed and used by the CONDUIT Project for evaluating computer-based instructional packages for post-secondary institutions, with additional concepts adopted from forms developed by other organizations and individuals.

The *Evaluator's Guide* was originally designed to be used by school personnel participating in the courseware evaluation process of MicroSIFT. It has been found useful by individual teachers or others wishing to evaluate courseware before purchasing, and as a supplement to preservice and inservice courses concerned with the development or use of computer-based applications.

## PROCESS

In December 1979, under a contract with the National Institute of Education, the Computer Technology Program of the Northwest Regional Educational Laboratory began designing a clearinghouse for microcomputer-based educational software and courseware. The clearinghouse, called MicroSIFT (Microcomputer Software and Information for Teachers), has as one of its goals the development and implementation of an evaluation process and related instruments for such courseware.

The design of MicroSIFT includes a selected network, SIFTnet, of significant centers of instructional computing activities at the K-12 level. The centers are large school districts, regional consortia or other education agencies where a full time instructional computing staff exists, and which have a history of development, evaluation and implementation of instructional applications of computers. This network forms the basis for the evaluation process.

The four stages of the evaluation process include:

1. **Phase I—Sifting**

   This is the first look at a package. At this time, those programs that are not instructional in nature are screened out. In addition to a program's instructional value, the sifting phase determines a package's "operational readiness" and its "hardware compatibility" status. The MicroSIFT staff completes this stage. If the software fails to meet the MicroSIFT standards for this phase, the evaluation terminates.

2. **Phase II—Description**

   In Phase II, the package is briefly described, specifying the program format, instructional purpose and technique(s), type of package, available documentation, and the hardware configuration necessary for operation. The MicroSIFT staff completes most of this stage, using the *Courseware Description* form.

3. **Phase III—Peer Review**

   At least two teachers with experience in the subject and grade/ability level of the material are selected from schools served by the network site to evaluate courseware according to the content, instructional quality and technical quality criteria identified in the *Courseware Evaluation* form. The courseware is also evaluated by a network site expert who then completes a summary review. The summary review becomes the MicroSIFT evaluation of the package.

   Completion of Phase I-III takes approximately two months. The evaluations may or may not include observation of student use of the package.

4. **Phase IV—In-Depth Evaluation**

   Some materials, because of complexity or the amount of curriculum covered, warrant more extensive evaluation. Activities in this category would be pre- and post-testing, or detailed observation of student use of the package. This phase is not being implemented by MicroSIFT at this time. However, Dr. Della-Piana and the Research on Evaluation Program are continuing to develop methods and instruments to support and guide the evaluation of computer-based materials through observation of student activities during the use of a package.

## DEFINITION OF TERMS

In the field of microcomputers and education, terminology can easily be misinterpreted. So that everyone using this *Guide* will interpret words in the same way, a brief glossary is provided below. Each definition conforms to some standard use of the term, but is not necessarily a composite of all uses nor the more common use.

**Content**

Facts, terms, ideas, concepts, principles, theories and constructs which make up the subject matter of an instructional package.

**Courseware**

Software and printed materials which support instruction in a complete course of study or a definable subset of a course. In this sense, it is not required that all instructional activities be supported by the package or that the tutorial mode of instruction be employed. Even a 30-minute student activity aimed at one objective can be courseware in this definition.

**Materials**

Books, folders, envelopes, worksheets and similar terms. "User Support Materials" are items which support the activity of a person using a computer program.

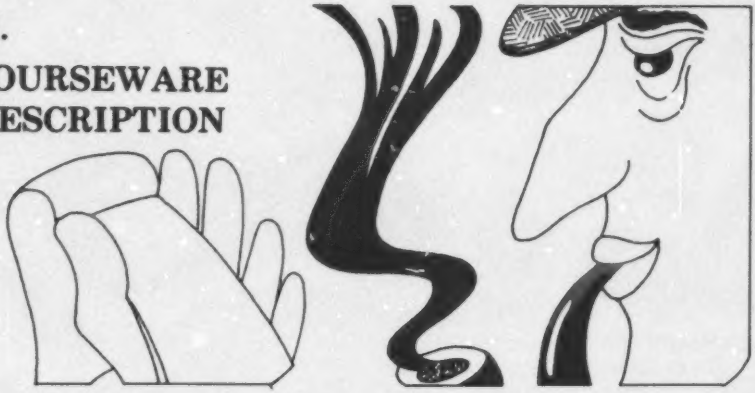
**Package**

One or more computer programs with related materials and the storage medium. A package represents a microcomputer application.

**Program**

A computer program, written in BASIC, Pascal, machine code or other computer programming language.

# II. COURSEWARE DESCRIPTION



Before evaluating a package, some factual information is needed. For example, does it have all the components necessary to make it a useful instructional package? Indeed, determining the existence of needed components is itself an evaluation.

The *Courseware Description* form identifies the information necessary for evaluation and use of a package. In some packages, a list of components is included. In a complete package, all the information should be readily available in the program and support materials.

Completing the form should be a straightforward task. If, however, the package fails to provide some information, you may be able to infer some of it by a trial use of the package.

Some sections of the *Courseware Description* form are discussed below.

**Version Evaluated**

A version number, date, or hardware identifier which distinguishes the specific package on which the evaluation is based.

**Producer**

The original source (developer, publisher, author, individual) who produced the package.

**Subject Area(s)**

A general area such as mathematics, reading or history.

**Specific Topic(s)**

A subset of Subject Area such as multiplication, phonics or World War I.

**Grade/Ability Level**

The grade level, grade range, or other ability level indicator for which the package is intended.

**Required Hardware**

Identify the minimum hardware required for package use.

- Computer (brand, version)
- RAM amount
- Mass Storage Devices (disk drive, cassette)
- Output Devices (color or black-and-white monitor or TV, printer)
- Other Peripherals (joystick, paddles, voice synthesizer)
- Special Electronics (circuit cards, interfaces)

**Available for Hard Disk**

Check "yes" if the software can be copied onto a central disk system for a cluster of computers, thus making it available for more than one computer at a time.

**Required Software**

Identify the language, operating system and utility software required to install and use the application software in the package. Include any drivers, subroutines or special software requirements not in the package or standard in the hardware specified.

**Software Protected**

Check "yes" if the software is protected from casual copying through software or hardware means.

**Medium of Transfer**

Check the medium the software is stored on.

**Back Up Policy**

Note the policy of the producer in providing back up copies of programs in a package, whether through providing it with the package, sending it free or at low cost by request or purchaser, no policy or other appropriate note.

**Field Test Data**

Indicate whether or not the producer has conducted a field test and makes the data available.

**Instructional Purposes and Techniques**

Check all items that describe the techniques employed in the package.

**Documentation Available**

For the items in the package, circle S if the documentation is in printed supplementary materials. Circle P if the item is contained in the program.

**Objectives**

List the purposes, goals or objectives that the package is intended to achieve.

**Prerequisites**

Describe the experiences, skills, concepts, understandings, maturity and ability levels which the intended user should possess for successful use of the package.

**Describe Package Content and Structure**

- Abstract of Content

  This information should be available in the material provided by the producer of the package. However, you may wish to add comments if the description is incomplete or inaccurate. Some suggested components of the description are discussed below.

- General Content

  Describe the general content domain of the package.

- User's Role

  Describe the dimension of user control over rate, sequence, amount, type and content of problem examples, if applicable. For example:

  "The user determines how much time will be allowed for solving each problem."

  "The user defines the number of hospitals, the amount of medicine available and the quantity of pesticides used for mosquito control."

- Instructional Strategy

  Describe the instructional strategy used in the courseware. For example:

  "This is a drill and practice program designed to increase student proficiency and speed in solving quadratic equations."

"This courseware simulates a malaria control situation by determining cost effectiveness and impact of the variables selected by the user."

- Instructional Integration

  Describe the degree to which the package is or can be an integral part of instruction. For example, it may be intended as a random or casual supplement, chosen by teacher or students, one of several options. On the other hand, it may be the only way an important topic can be addressed with a student activity.

- Program Structure

  Describe the flow or sequence of activity in the program. For example:

  "The program contains three major sections: a presentation of an example, a section of controlled user activity, and a section of uncontrolled user exploration."

# III.

# COURSEWARE EVALUATION

The *Courseware Evaluation* form is designed to be used after the information in the *Courseware Description* form is available. The rating of the 21 items on the form is to be the starting point of the evaluation. The sections of the form are described in the sequence they are to be completed.

Judgments should be based on thorough investigation of the program and support materials in the package. It is intended that where the term "package" is used, all components are to be taken into account in making the evaluation.

**Rating**

Items 1 through 21 are to be rated on the scale provided. It is anticipated that in some cases a given item may be meaningless for the package being evaluated, and so NA (Not Applicable) should be circled.

*NOTE:* The descriptions of each of the items on the following pages are intended to be suggestions for consideration in arriving at a judgment of the item. They are *not* necessarily checklists, are *not* in order of importance, and are *not* exhaustive of possible considerations. The alphabetic identifiers are merely for reference purposes.

**Comments**

Brief comments concerning the rating of any item may be written on the reverse side of the form.

**Student Use**

It is not expected that student use of a package be observed in this

evaluation process. You, as a professional, are making a judgment based on your teaching experience in the grade level and subjects intended for the package. However, if it is convenient to observe student use of the package, the evaluation may be even more valuable. If students take part, check the box at the top of the *Courseware Evaluation* form.

## CONTENT CHARACTERISTICS

1. **THE CONTENT IS ACCURATE.**

   Possible problems in content accuracy include:

   a. Outdated information or instructional approach.

   b. Factual errors.

   c. Invalid model used in a simulation.

   d. Oversimplified model or examples.

   e. Improper use of statistics.

   f. Inaccurate graphs or displays.

2. **THE CONTENT HAS EDUCATIONAL VALUE.**

   Any decision on this item will be highly subjective. Some considerations leading to a positive judgment might include:

   a. The content and objectives are addressed in common school curricula.

   b. The knowledge and skills involved have utility in some aspect of life.

   c. An instructional situation can be envisioned in which the package would be useful.

   d. Use of the package enables you to learn something about the nature or needs of the student using it.

   e. The content of the package is central to the subject field.

3. **THE CONTENT IS FREE OF RACE, ETHNIC, SEX AND OTHER STEREOTYPES.**

   a. Certain racial, ethnic or sex groups may be over-represented at the expense of limiting others.

   b. Some racial, ethnic or sex groups may be portrayed in terms that are indicative of false generalizations about the characteristics of that group.

## INSTRUCTIONAL CHARACTERISTICS

### 4. THE PURPOSE OF THE PACKAGE IS WELL DEFINED.

Purposes, goals and objectives may be in the program or in user support materials. The identification of instructional objectives is important to the transferability and use of an instructional package.

a. Objectives should be explicit, rather than inferred.

b. Objective statements should be clear, i.e., unambiguous and without multiple meanings, succinct, free of jargon.

c. Objectives should be stated in terms of expected student behaviors.

The package should include both general and specific statements of purpose. That is, the overall purpose of the package ought to be concisely stated, with specific objectives stated for specific components.

### 5. THE PACKAGE ACHIEVES ITS DEFINED PURPOSE.

Courseware can be evaluated in much the same way that other instruction is evaluated, the starting place being the instructional objectives. Based on these objectives, the student using the instructional package should learn what the material sets out to teach, rather than merely being engaged in the process.

The most effective way to substantiate this aspect of instructional quality is through a sample run of the program, preferably with a learner from the target audience. However, if such a learner is not available, the evaluator should make a judgment as to how well the package would actually accomplish its objectives when used by a student of the appropriate maturity and ability, based on the evaluator's experience with students of that type.

### 6. PRESENTATION OF CONTENT IS CLEAR AND LOGICAL.

The focus of this item is on *how* the terms, facts, concepts and principles of the subject matter are presented rather than on the content itself.

a. The information is well organized.

b. The structure of the presentation is evident to a user.

c. Definitions and explanations are available when necessary.

d. There is a smooth transition between concepts and cognitive clusters.

e. The progression of presentation is logical and well identified.

f. Examples, counter-examples and illustrations are used when possible and appropriate.

g. The examples are relevant to the point of instruction.

7. **THE LEVEL OF DIFFICULTY IS APPROPRIATE FOR THE TARGET AUDIENCE.**

a. The means of response (i.e., multiple choice, manipulating graphics, single keystroke, etc.) is appropriate to the target audience.

b. The readability of support materials and program text is consistent with the expected ability level of the audience. Vocabulary, phrasing and sentence length are specific considerations here.

c. Examples and graphic illustrations are suitable for the maturity of the student.

d. The time required for typical student use does not exceed the attention span of the target audience.

e. Size of steps in logical processes are suited to the ability level of the student.

f. There are multiple levels of instruction, with diagnostic and reinforcement routines, for individual differences in the target audience.

- The program automatically branches to remediation subroutines if user responses require.
- The program automatically progresses to more difficult problems to continually provide a challenge to the user who has mastered the easier problems.
- The program automatically provides easier problems to the user who is having trouble.

8. **GRAPHICS/COLOR/SOUND ARE USED FOR APPROPRIATE INSTRUCTIONAL REASONS.**

a. Graphics, color and sound enhance rather than detract from the instructional process.

b. Use of sound does not disturb others in a classroom environment.

c. Graphics, color and sound focus attention on important content areas.

d. Good message design principles are used in order to place emphasis on important concepts.

e. Visual and auditory effects stimulate student interest.

9. **USE OF THE PACKAGE IS MOTIVATIONAL.**

a. Students are effectively addressed in a personal style.

b. Narratives in the program use humor and a conversational manner.

c. The overall tenor of interaction is warm, friendly, helpful.

d. The package provides for a variety of student response and response modes.

e. A variety of responses to student inputs are used.

f. Reinforcement is positive and dignified.

g. A student is left with a desire to use the package again, or to pursue the topic in other ways.

h. A student is left with a positive attitude about the experience.

i. Using the package is a pleasant experience.

10. **THE PACKAGE EFFECTIVELY STIMULATES STUDENT CREATIVITY.**

a. The learner is involved in a active, rather than passive, manner in the instruction.

- The student has control over as many input variables as the program permits.
- The computer is used in a "hands-on" way, rather than merely in a presentation mode.
- The program design allows the student as many decisions as possible.

b. The package provides opportunities to answer open-ended questions that have no "right" or "wrong" answers, and gives the student evaluative criteria to judge his/her own responses.

c. The program is designed to anticipate a wide range of possible responses.

d. The student is provided with new ways of looking at the world.

e. The package demonstrates a creative means of using the knowledge being acquired by the user.

f. The package suggests areas of further exploration or other activity.

g. The student is challenged to change an underlying model or design an alternative model.

11. **FEEDBACK ON STUDENT RESPONSES IS EFFECTIVELY EMPLOYED.**

a. The feedback is relevant to the students' responses and therefore "credible."

b. The feedback is non-threatening, yet corrective when necessary.

c. The feedback is timely, i.e., given with appropriate frequency and given immediately after a response.

d. The feedback remediates (gives cues, hints and explanations).

e. There is quantitative feedback when valuable.

- The program indicates the number and percentage of problems correct out of the number of problems attempted.

f. The feedback tells "why" the response was incorrect, e.g., "You should have spelled the name correctly," or "Use no punctuation."

g. The judgment of the student responses properly assesses the concept being taught, not merely its form.

- Is word order more important than the content of the response?

h. The program adapts to the learner by adjusting the difficulty level of the content.

12. **THE LEARNER CONTROLS RATE AND SEQUENCE OF PRESENTATION AND REVIEW.**

a. Student has control over the time allowed for solving problems, allowing for accelerating or slowing the pace as the user deems necessary.

b. Student has control over the rate of presentation of display material so that s/he can read and absorb the information at his/her own rate.

c. The program does not lock the student into a linear instructional sequence.

d. The program allows the student to begin at a point appropriate to his/her past achievements.

e. The program has a provision for review of instructions initiated by the user.

On the following pages you will find the *Courseware Description Form* and the *Courseware Evaluation Form*.

Permission is given to reproduce both forms.

# microSIFT COURSEWARE DESCRIPTION

NORTHWEST REGIONAL EDUCATIONAL LABORATORY

Title _____ Version Evaluated _____

Producer _____ Cost _____

Subject/Topics _____

Grade Level(s) (circle) pre-1 1 2 3 4 5 6 7 8 9 10 11 12 post-secondary

Required Hardware _____

Available for Hard Disk? ☐ Yes ☐ No ☐ Unknown

Required Software _____

Software protected? ☐ Yes ☐ No Medium of Transfer: ☐ Tape Cassette ☐ ROM Cartridge ☐ 5¼" Flexible Disk ☐ 8" Flexible Disk

Back Up Policy _____

Producer's field test data is available ☐ On Request ☐ With Package ☐ Not Available

**INSTRUCTIONAL PURPOSES & TECHNIQUES**

(Please check all applicable):

- ☐ Remediation
- ☐ Standard Instruction
- ☐ Enrichment
- ☐ Assessment
- ☐ Instructional Management
- ☐ Authoring
- ☐ Drill and Practice
- ☐ Tutorial
- ☐ Information Retrieval
- ☐ Game
- ☐ Simulation
- ☐ Problem Solving
- ☐ Other _____

**DOCUMENTATION AVAILABLE:**

Circle P-(Program) or S-(Supplementary Material)

| | | | | | |
|---|---|---|---|---|---|
| P | S | Suggested grade/ability level(s) | P | S | Teacher's information |
| P | S | Instructional objectives | P | S | Resource/reference information |
| P | S | Prerequisite skills or activities | P | S | Student's instructions |
| P | S | Sample program output | P | S | Student worksheets |
| P | S | Program operating instructions | P | S | Textbook correlation |
| P | S | Pre-test | P | S | Follow-up activities |
| P | S | Post-test | P | S | Other _____ |

**OBJECTIVES:** ☐ Stated ☐ Inferred

**PREREQUISITES:** ☐ Stated ☐ Inferred

Describe package **CONTENT AND STRUCTURE**, including record keeping and reporting functions:

(Use back if additional space needed)

# microSIFT COURSEWARE EVALUATION

NORTHWEST REGIONAL EDUCATIONAL LABORATORY

Package Title _____ Producer _____

Evaluator Name _____ Organization _____

Date _____ ☐ Check this box if this evaluation is based partly on your observation of student use of this package.

SA-Strongly Agree A-Agree D-Disagree SD-Strongly Disagree NA-Not Applicable

Please include comments on individual items on the reverse page.

## CONTENT CHARACTERISTICS

1. SA A D SD NA The content is accurate. (p. 16)
2. SA A D SD NA The content has educational value. (p. 16)
3. SA A D SD NA The content is free of race, ethnic, sex and other stereotypes. (p. 16)

## INSTRUCTIONAL CHARACTERISTICS

4. SA A D SD NA The purpose of the package is well defined. (p. 17)
5. SA A D SD NA The package achieves its defined purpose. (p. 17)
6. SA A D SD NA Presentation of content is clear and logical. (p. 17)
7. SA A D SD NA The level of difficulty is appropriate for the target audience. (p. 18)
8. SA A D SD NA Graphics/color/sound are used for appropriate instructional reasons. (p. 18)
9. SA A D SD NA Use of the package is motivational. (p. 19)
10. SA A D SD NA The package effectively stimulates student creativity. (p. 19)
11. SA A D SD NA Feedback on student responses is effectively employed. (p. 20)
12. SA A D SD NA The learner controls the rate and sequence of presentation and review. (p. 20)
13. SA A D SD NA Instruction is integrated with previous student experience. (p. 29)
14. SA A D SD NA Learning can be generalized to an appropriate range of situations. (p. 29)

## TECHNICAL CHARACTERISTICS

15. SA A D SD NA The user support materials are comprehensive. (p. 30)
16. SA A D SD NA The user support materials are effective. (p. 31)
17. SA A D SD NA Information displays are effective. (p. 31)
18. SA A D SD NA Intended users can easily and independently operate the program. (p. 32)
19. SA A D SD NA Teachers can easily employ the package. (p. 34)
20. SA A D SD NA The program appropriately uses relevant computer capabilities. (p. 34)
21. SA A D SD NA The program is reliable in normal use. (p. 35)

## QUALITY

Write a number from 1 (low) to 5 (high) which represents your judgment of the quality of the package in each division:

_____ Content Characteristics

_____ Instructional Characteristics

_____ Technical Characteristics

## RECOMMENDATIONS

☐ I highly recommend this package.

☐ I would use or recommend use of this package with little or no change. (Note suggestions for effective use below.)

☐ I would use or recommend use of this package only if certain changes were made. (Note changes under Weaknesses or Other Comments.)

☐ I would not use or recommend this package. (Note reasons under Weaknesses.)

Describe the potential use of the package in classroom settings:



(Additional items on back)

Estimate the amount of time a student would need to work with the package in order to achieve the objectives:
(Can be total time, time per day, time range or other indicator.)

Strengths:

Weaknesses:

Other Comments:

f. The program defines "functions" for learner options such as HELP, HINT, DICTIONARY.

13. **INSTRUCTION IS INTEGRATED WITH PREVIOUS STUDENT EXPERIENCES.**

a. Instruction is designed to take into account the background experiences typical of the target audience.

b. Inductive reasoning is employed. Known situations are used to explain new situations.

c. Commonly experienced examples are used.

- Some students may better understand the liquid metric measurements within the context of filling the car with gasoline rather than filling a graduated cylinder with water.

d. Instruction moves from the concrete to the abstract, simple to complex, familiar to unfamiliar.

14. **LEARNING CAN BE GENERALIZED TO AN APPROPRIATE RANGE OF SITUATIONS.**

a. The learning is applicable to a student's future experiences.

- The instruction prepares the user for the next unit in the package.

b. The student is presented with opportunitites that require generalization of the rules acquired at the computer and opportunities to apply those rules to real life situations away from the computer.

c. The processes and information learned are useful in domains and situations other than the subject area of the package.

d. The content is organized in such a way as to facilitate recall and application away from the computer and outside of the immediate content domain.

- Is the metric system taught within the context of the decimal system or as isolated measurements (meter, gram, liter, etc.)?

## TECHNICAL CHARACTERISTICS

15. **THE USER SUPPORT MATERIALS ARE COMPREHENSIVE.**

In this item, you are assessing the completeness of the package in terms of its support for the teachers and students in the intended pattern of use, and reasonable optional uses. Many different types of information may be included in the printed material accompanying the program. The components of good user support materials identified here can be packaged in many ways. Separate identification does not imply a need for separate booklets, although that may be desirable. (See also item 16.)

a. Student Materials: Sufficient materials for a variety of student activities should be provided:

- Pre-instruction activities relating to the package
- A guide to use of the package
- Follow-up activities to reinforce the instruction
- Worksheets

b. Teacher's Information

- A description of the instructional activities to take place
- Suggestions for classroom logistics in a variety of hardware situations (single or multiple machines, hardware not in classroom, etc.)
- A rationale for computer use
- Prerequisite skills necessary for best utilization
- Teacher directed pre- and post-instructional activities

c. Resource Information

- Bibliography of resources and references related to the content domain
- Sample run of the program
- Possibilities for program modifications
- A description of the model used in simulations

d. Technical Documentation

- Detailed explanation of how the program and package operate
- Program code listings

- Explanation of user-definable options to adapt the program for different applications
- Explanation of the software/hardware interface or any other extraordinary features of the program
- Flowchart or other diagrams of general logic of individual programs and package
- Interpretation of error messages

e. Containers

- Folders, binders, pockets for storing printed materials, disks, cassettes or other components
- Boxes or other container(s) for organizing and storing the entire package

16. **THE USER SUPPORT MATERIALS ARE EFFECTIVE.**

a. The appearance of the materials is attractive.

b. The quality of the paper or binding is appropriate to its intended use and expected life.

c. The printed text is clear, readable and attractive.

d. Pictures, diagrams and graphs are appropriate and readable.

e. The text, captions, labels, etc. are thoroughly edited and free of errors in grammar, spelling and punctuation.

f. The packaging of the materials is suitable for the intended use.

- Student worksheet masters intended for reproduction are "loose leaf" or easily reproduced.
- Teacher support materials can be separated from student materials.

g. The program storage media are easily accessible, yet protected from random injury expected in mailing, dropping, etc.

h. The entire package is storable as a unit in standard storage facilities (office shelves, cabinets, etc.).

i. Materials are easily used in table space typically available near a microcomputer station.

17. **INFORMATION DISPLAYS ARE EFFECTIVE.**

Good message design principles are incorporated into the visual arrangement of display material.

a. Graphic displays are not too complex or full of too much information.
   - There is adequate spacing on the screen or printed materials for clarity.
   - Static and dynamic graphics are used when applicable.
   - Screen and printed displays make effective use of open space.

b. Text narrative on the monitor or printer is clear and easy to read.

c. Narrative is not ambiguous.

d. Text information is not too lengthy or "wordy."

e. The user is given adequate time to read and absorb the information given in the displays.

f. Text is free from spelling and punctuation errors.

g. Character sets employed are appropriate for the intended audience.

h. Graphics are not too repetitive or too slow in presentation.

i. Input options are independent of color, or at least avoid common color blindness problems.

j. There is not too much text for the display.
   - The text position is consistent and/or predictable (i.e., the student does not have to hunt for the information).

k. Graphics are appropriately mixed with text material to give variety to the presentation.

l. Transitions from display to display on a video screen are smooth and unobtrusive.

m. Scrolling is used appropriately. Only pertinent information is retained on the screen.

n. Adequate teacher/student options for use or non-use of sound are provided.

o. Graphics are not disturbing to the user.

18. **INTENDED USERS CAN EASILY AND INDEPENDENTLY OPERATE THE PROGRAM.**

a. The program has enough internal documentation to permit ease of use even without external paper documentation.

b. Formats and protocols for user-computer communication are consistently and logically applied.

c. Directions are accompanied by useful examples where appropriate.

d. Help pages and functions are provided and accessible at likely points of need.

e. The program does not allow the user to get lost in the program with no apparent way out. The student always has some options for getting the program running again or returning to a beginning point.

f. The program doesn't stop or appear to be doing nothing without cues.

g. Traps are used copiously to catch potential errors of any kind, and to avoid moving control from the application to the operating system.

h. Instructions and error messages are clear and unambiguous. They give the user clear directions as to what s/he must do to effectively use the program.

i. The program responds to inputs as the directions indicate.

j. The user can easily exit the program, return to menus, or move to another section with program-described conventions.

k. The program accurately evaluates student input, i.e., it does not misinterpret student responses and thereby identify a response as incorrect when it is in fact correct.

l. Computer operation does not interfere with concentration on the activity.

m. The program can be used with a minimum of computer competencies.

n. The user isn't uneasy using the software due to its complexity of operation.

o. The user is informed of which function keys s/he will use in the course of the program and their purpose.

p. There is the necessary cueing for function key usage.

q. Those function keys referred to in the program are available on the hardware.

r. The use of function keys does not necessitate re-input of user responses previously input into the computer.

19. **TEACHERS CAN EASILY EMPLOY THE PACKAGE.**

Not only should the program be easily used by students, but it should be equally employable by teachers. Many of the same considerations as in item 18 can be applied here, and in addition:

a. The program can be used by a person having a minimum of computer competencies.

b. The program requires a minimal amount of equipment manipulation by the teacher.

c. Software modifications or unusual manipulations of disks are not required to use the program effectively.

d. The package is easily adaptable to a variety of classroom learning environments, including placement of hardware inside or outside the classroom.

e. Error handling and identification are sufficiently detailed so the teacher can easily help a student.

f. Students require a minimum amount of teacher supervision while using the program.

20. **THE PROGRAM APPROPRIATELY USES RELEVANT COMPUTER CAPABILITIES.**

The success of the computer as a means for instruction is due to those capabilities inherent in the technology. Computer software should take full advantage of the unique aspects of the computer rather than merely doing the same activities in a new way.

a. The application is well suited to computer use and not one that can be handled more appropriately by other means.

b. Course management or computer collection and organization of data on instruction is available.

- Information about the student's performance is stored for retrieval at a later time.

c. The computer is used in a dynamic, interactive way.

- The computer makes decisions based on student performance according to the teaching strategies inherent to the program.

d. The computer makes effective use of other peripheral devices (e.g., printers, light pens, paddle controllers, joysticks, etc.) for alternate input modes.

e. The computer is used to simulate activities that are too difficult, dangerous or expensive to demonstrate in reality.

f. The computer is used so that students are actively involved in a "hands-on" manner rather than only passively observing.

g. The computer responds to natural student input such as "YES" or "NO" or "Y" or "N", rather than "1 = YES, 2 = NO."

21. **THE PROGRAM IS RELIABLE IN NORMAL USE.**

a. The program will consistently run under all normal conditions. No special precautions such as clearing memory are required for effective program execution.

b. The program will consistently load into the computer without undue complexity such as re-loading.

c. The program is free of programming and operational errors.

## QUALITY

Using a 5-point rating scale (1—low to 5—high), write a number for each category which represents your best overall judgment on the quality of the package in each of the three general categories. Although you may consider your responses on items 1-21, no mathematical calculation will connect the two sections. The Quality judgment is a separate decision.

## RECOMMENDATIONS

Having concluded a review of the instructional objectives, prerequisite activities, content and structure, and having rated the various considerations of content, instruction and technical quality, you are then ready to make a recommendation for use of the package.

Under Recommendations, you have four options from which to choose to represent your estimation of the program's usability. (Elaboration can be made in other sections, which ask for ways the program can be used effectively, and for identification of the major strengths and weaknesses in the program.

**Highly Recommend**
**I highly recommend this package.**

**Recommend Package**
**I would use or recommend use of this package with little or no change.** (Note suggestions for effective use below.)

**Recommend with Changes**
**I would use or recommend use of this package only if certain changes were made.** (Note changes under Weaknesses or Other Comments.)

**Do Not Recommend**
**I would not use or recommend this package.** (Note reasons under Weaknesses.)

In completing the sections on the back of the form, the evaluator should refer to Content Characteristics, Instructional Characteristics and Technical Characteristics (Sections 1-21 of the *Courseware Evaluation* form). These ratings, along with any notes or comments made, should serve as the basis for specifying the program's strengths and weaknesses.

**DESCRIBE THE POTENTIAL USE OF THE PACKAGE IN CLASSROOM SETTINGS.**

The checklist (1-21) of the *Courseware Evaluation* form should be completed before this item. A recommendation for use with or without changes should be accompanied in this space by a description of the possible use(s) you envision for the package in specific classroom settings. The description might include:

a. Different audience characteristics to whom the program is applicable.

"The package should be used with individuals and small groups only."

"Program could also be used with audiences older than the recommended target audience."

b. Different teaching modes the program may enhance.

"The package can be used to introduce the topic."

"The courseware can be used to reinforce related instruction and to test the adequacy of that instruction."

c. Any "unique" applications the courseware may have.

"The package can be used in a "contest" form to see which team can devise the best strategy for solving the problem."

**ESTIMATION OF STUDENT TIME**

Estimate the amount of time a student would need to work with the package in order to achieve the objectives. Can be stated as total time, time per day, time range or other indicator.

**STRENGTHS**

**Content Strengths**

"The laboratory simulation was accurate and could be used in place of the real laboratory situation."

"The instructional objectives are stated and are very specific as to terminal performance behavior."

**Instructional Strengths**

"The user has control over many of the variables affecting his/her instruction."

"The simulation adequately considers all of the variables related to the problem."

### Technical Strengths

"The directions were very clearly stated, giving examples when necessary."

"The documentation is thorough and comprehensive."

## WEAKNESSES

### Content Weaknesses

"Some equations were graphed incorrectly on the monitor."

"The recommended audience age is too young for program content."

### Instructional Weaknesses

"The program does not allow students to generate their own answers—they may only choose among four options."

"The student only watches the program. There is no active participation in the courseware."

### Technical Weaknesses

"The computer was used as nothing more than an electronic textbook. No unique interactive characteristics were used."

"The documentation included only a listing of the program. No objectives or prerequisites were mentioned."

## OTHER COMMENTS

Place here general comments which may be neither strengths nor weaknesses, but nevertheless provide useful information to a potential user. Cost issues could be included here. Cost effectiveness is difficult to measure, and the value of a particular package varies with the priorities of the district or school. However, it may be appropriate in some cases to comment on whether the cost as identified on the *Courseware Description* form is extraordinarily high or low for its capabilities.

*Editor's Note: Before releasing these reviews, MicroSIFT has submitted reviewers' descriptions, comments and ratings to vendors of the programs. Vendors' responses were considered before the final reviews were written.*

## Bumble Plot

**Producer:** The Learning Company
4370 Alpine Road
Portola Valley, CA 94025

**Evaluation Completed:** May 1983 by the staff and constituents of TIES, Roseville, Minnesota.
**Version:** 1982.
**Cost:** $39.95

**Ability Level:** Grades 3-8.
**Subject:** Mathematics.
**Topic:** Arithmetic.
**Medium of Transfer:** 5¼" flexible disk.
**Required Hardware:** 48K Apple II or Apple IIe, disk drive, monitor (preferably color).
**Required Software:** Applesoft, DOS 3.3.
**Instructional Purpose:** Enrichment.
**Instructional Techniques:** Drill and practice, game, problem solving.

### Documentation Available

Suggested grade/ability level(s), sample program output, program operating instructions, student's instructions, student worksheets, follow-up activities.

### Instructional Objectives

Through problem-solving games, the student will learn the concept of working on a grid.

### Instructional Prerequisites

It is assumed that the student has had previous experience with negative numbers.

### Content and Structure

The package consists of one disk, a small manual, and nine activity cards in a hard cardboard folder. The program includes five games starting with a number line and progressing to a 10 x 10 grid using both positive and negative numbers.

### Estimated Student Time Required

The time needed to run a game would depend on age and ability of user, but one might allow at least 15-20 minutes per activity.

### Potential Uses

The package would be appropriate for individual or small group use for drill and practice or problem-solving activities.

### Major Strengths

The activities provide good practice in using coordinates with negative numbers. "Bumble Art" offers a chance for creative expression which is rare for software. "Road Block" is a highly motivational exercise in problem-solving using coordinates.

### Major Weaknesses

The rewards for achieving goals could be better. With all the delightful graphics and sound in the introductions, the printed words, "YOU GOT IT" as a reward are a let down.

EVALUATION SUMMARY

| SA | A | D | SD | NA | |
|---|---|---|---|---|---|
| • | | | | | Content is accurate. |
| • | | | | | Content has educational value. |
| • | | | | | Content is free of stereotypes. |
| | | • | | | Purpose of package is well defined. |
| | • | | | | Package achieves defined purpose. |
| | • | | | | Content presentation is clear and logical. |
| • | | | | | Difficulty level is appropriate to audience. |
| • | | | | | Graphics/sound/color are used appropriately. |
| • | | | | | Use of package is motivational. |
| • | | | | | Student creativity is effectively stimulated. |
| | • | | | | Feedback is effectively employed. |

| SA | A | D | SD | NA | |
|---|---|---|---|---|---|
| | • | | | | Learner controls rate and sequence. |
| | • | | | | Instruction integrates with prior learning. |
| | • | | | | Learning can be generalized. |
| | | • | | | User support materials are comprehensive. |
| | • | | | | User support materials are effective. |
| • | | | | | Information displays are effective. |
| • | | | | | Users can operate easily and independently. |
| • | | | | | Teachers can employ package easily. |
| | • | | | | Computer capabilities are used appropriately. |
| • | | | | | Program is reliable in normal use. |

SA - Strongly Agree A - Agree D - Disagree SD - Strongly Disagree NA - Not Applicable

Evaluators indicated that they would highly recommend this package.

Northwest Regional Educational Laboratory
300 S.W. Sixth Avenue • Portland, Oregon 97204
(503) 248-6800

*This evaluation is based on the evaluations of three or more reviewers who are representative of potential users of the courseware package.*

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## Word Games

**Producer:** MECC Publications
2520 Broadway Drive
St. Paul, MN 55113

**Evaluation Completed:** April 1983 by the staff and constituents of Linn-Benton County ESD, Albany, Oregon, and the staff of the Northwest Regional Educational Laboratory, Portland, Oregon.
**Cost:** $37.00.

**Subject:** Language arts.
**Topic:** Spelling.
**Medium of Transfer:** 5¼" flexible disk.
**Required Hardware:** Atari 400 or 800 computer, one Atari 810 disk drive, monitor.
**Required Software:** Atari BASIC cartridge.
**Instructional Purpose:** Remediation, standard instruction.
**Instructional Techniques:** Drill and practice, game.

### Documentation Available

***In program***—program operating instructions and student's instructions.
***In supplementary materials***—suggested grade/ability level(s), instructional objectives, prerequisite skills or activities, sample program output, program operating instructions, teacher's information, student's instructions, student worksheets, and follow-up activities.

### Instructional Objectives (Stated)

To reproduce correct spelling by visual recall; to recognize the combinations of letters which form words or parts of words; to infer words from definitions.

### Instructional Prerequisites (Stated)

Students should be familiar with the operation of the computer and the keyboard.

### Content and Structure

This package contains four language arts programs. A short description of each follows. RECALL flashes a word on the screen for recall and correct spelling. SCRAMBLE randomizes the sequence of letters in a word to be unscrambled. GUESS WORD presents a series of dots in place of letters and a clue to help identify the word to be guessed. LIST MAKER creates, edits or deletes a list of words for RECALL, SCRAMBLE or GUESS WORD.

## Potential Uses

This package is most appropriate for use with individual students for drill and practice on spelling and vocabulary. It would be good for remedial or resource settings. Another application might be to set up a contest for unscrambling words where the winner has the fewest number of attempts. The package is excellent for visual learners.

## Major Strengths

The package provides a way for the teacher to input his/her own word lists. This enables the teacher to tailor the package to fit the level of the students. Access to the word list is secured from unauthorized modification by a code word.

## Major Weaknesses

The directions for entering the word lists are a bit unclear and teachers had to frequently go to the documentation for help.

EVALUATION SUMMARY

| SA | A | D | SD | NA | |
|---|---|---|---|---|---|
| | • | | | | Content is accurate |
| • | | | | | Content has educational value |
| • | | | | | Content is free of stereotypes |
| | • | | | | Purpose of package is well defined |
| | • | | | | Package achieves defined purpose |
| | • | | | | Content presentation is clear and logical |
| | • | | | | Difficulty level is appropriate to audience |
| | • | | | | Graphics/sound/color are used appropriately |
| | • | | | | Use of package is motivational |
| | | • | | | Student creativity is effectively stimulated |
| | • | | | | Feedback is effectively employed |

| SA | A | D | SD | NA | |
|---|---|---|---|---|---|
| • | | | | | Learner controls rate and sequence |
| • | | | | | Instruction integrates with prior learning |
| • | | | | | Learning can be generalized |
| • | | | | | User support materials are comprehensive |
| • | | | | | User support materials are effective |
| • | | | | | Information displays are effective |
| • | • | | | | Users can operate easily and independently |
| • | | | | | Teachers can employ package easily |
| • | | | | | Computer capabilities are used appropriately |
| • | | | | | Program is reliable in normal use |

SA - Strongly Agree A - Agree D - Disagree SD - Strongly Disagree NA - Not Applicable

Evaluators indicated that they would use or recommend use of this package with little or no change.

Northwest Regional Educational Laboratory
300 S.W. Sixth Avenue • Portland, Oregon 97204
(503) 248-6800

*This evaluation is based on the evaluations of three or more reviewers who are representative of potential users of the courseware package.*

*Permission to reproduce this document is hereby granted.*

## Krell's College Board SAT

**Producer:** Krell Software Corporation
21 Millbrook Drive
Stony Brook, NY 11790

**Evaluation Completed:** June 1983 by the staff and constituents of Region IV ISC, Houston, Texas.
**Version:** 1981.
**Cost:** $249.95.

**Ability Level:** High School.
**Subject:** Mathematics, language arts.
**Topic:** SAT examination preparation.
**Medium of Transfer:** 5¼" flexible disk.
**Required Hardware:** 48K Apple II+, disk drive; monitor.
**Required Software:** Applesoft, DOS 3.3.
**Instructional Purpose:** Assessment.
**Instructional Techniques:** Drill and practice, tutorial.

### Documentation Available

***In program***—student's instructions. ***In supplementary materials***—suggested grade/ability level(s), instructional objectives, program operating instructions, teacher's information, student worksheets.

### Instructional Objectives (Stated)

To provide a set of study levels and aids that enable students to improve their personal performance on SAT and PSAT exams. Other objectives are stated on page 9 of the manual.

### Instructional Prerequisites (Inferred)

Package was developed for students preparing to take the SAT exam.

### Content and Structure

In each of the six diskettes in the series, the student is provided with drill and practice exercises designed to improve skills in specific areas (math, vocabulary, word relationships, reading and sentence comprehension, tests of written English). The student can choose to see the reasoning or logic behind the correct answer whether or not he responds incorrectly to a problem. (The manual provides source materials used in some of the programs.) The student is given immediate feedback and scores and is provided with an opportunity to request another problem of the same type. Optional features include a worksheet generator, diagnosis and study prescriptive, classroom management system, vocabulary builder package, and complete classroom tutorial package (available in 1984).

### Estimated Student Time Required

The time could vary widely since the student is allowed to choose the number of problems he wants. Probably 15 minutes to one hour.

### Potential Uses

The package would be used in a college bound class or college prep course to help students prepare for the SAT or PSAT. This package could be used by individual students as a self-help program of study.

### Major Strengths

The directions are clear and the program is easy to use. The student gets immediate feedback and can ask for an explanation of correct answers. The format is consistent with SAT scoring and question types.

### Major Weaknesses

The management system costs extra—it is not included with the package. Some words are truncated. The sentence, "Neither parents nor wife know of HER (Edward's) activities." appears in Test #7, Disk TSWEZ. The format is not consistent from one disk to another, as if there were different programmers.

### Other Comments

Documentation implies that networking license is available.

EVALUATION SUMMARY

| SA | A | D | SD | NA | |
|---|---|---|---|---|---|
| • | | | | | Content is accurate. |
| • | | | | | Content has educational value. |
| • | | | | | Content is free of stereotypes. |
| | • | | | | Purpose of package is well defined. |
| | • | | | | Package achieves defined purpose. |
| | • | | | | Content presentation is clear and logical. |
| • | | | | | Difficulty level is appropriate to audience. |
| | | • | | | Graphics/sound/color are used appropriately. |
| | • | | | | Use of package is motivational. |
| | | • | | | Student creativity is effectively stimulated. |
| | • | | | | Feedback is effectively employed. |

| SA | A | D | SD | NA | |
|---|---|---|---|---|---|
| | • | | | | Learner controls rate and sequence. |
| | • | | | | Instruction integrates with prior learning. |
| | • | | | | Learning can be generalized. |
| | • | | | | User support materials are comprehensive. |
| | • | | | | User support materials are effective. |
| | • | | | | Information displays are effective. |
| • | | | | | Users can operate easily and independently. |
| • | | | | | Teachers can employ package easily. |
| | • | | | | Computer capabilities are used appropriately. |
| | • | | | | Program is reliable in normal use. |

SA - Strongly Agree A - Agree D - Disagree SD - Strongly Disagree NA - Not Applicable

Evaluators indicated that they would use or recommend use of this package with little or no change.

Northwest Regional Educational Laboratory
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*This evaluation is based on the evaluations of three or more reviewers who are representative of potential users of the courseware package.*

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## Three Mile Island

**Producer:** Muse Software
330 N. Charles Street
Baltimore, Maryland 21201

**Evaluation Completed:** March, 1983 by the staff and constituents of Oakland ISD, Pontiac, Michigan.
**Cost:** $39.95.

**Ability Level:** Grade 12 and postsecondary.
**Subject:** Physical science.
**Topic:** Nuclear reactors.
**Medium of Transfer:** 5¼" flexible disk.
**Required Hardware:** 48K Apple II with single disk drive and color monitor.
**Instructional Purpose:** Enrichment.
**Instructional Techniques:** Simulation, game.

### Documentation Available

***In program***—program operating instructions and student's instructions.
***In supplementary materials***—suggested grade/ability level(s), instructional objectives, sample program output, program operating instructions, resource/reference information, and student's instructions.

### Instructional Objectives (Inferred)

To provide a simulation of the operation of a nuclear power plant.

### Instructional Prerequisite (Inferred)

The student must have some prior instruction on how a reactor works.

### Content and Structure

This program is a simulation of the operation of a nuclear reactor. Graphic screens show portions of a nuclear reactor as the student simulates the conditions of running a plant. A lengthy support booklet is included.

### Estimated Student Time Required

Fifteen minutes to one hour.

### Potential Uses

The package could be used as a classroom demonstration, for individual enrichment experience, or with small groups.

## Major Strengths

*Three Mile Island* is a realistic simulation of the operation of a nuclear reactor, a very timely and interesting topic. The package is very comprehensive and covers the topic very thoroughly. It is easy to use, and the graphics and technical displays are excellent. The operation of the program is fairly complete as it needs to accurately simulate the reactor operation. The program is challenging enough not to be boring and uses graphics fairly well to let the user manipulate the operation of the reactor. It can be "fun" while students realize the complexities of the undertaking.

## Major Weaknesses

Too much time is required to prepare for using the program. It is difficult to use in large group applications. The program is suitable only for advanced high school students. There is a 35-page instruction manual as the only documentation. It took one evaluator about four hours to *begin* to understand what should be done, and the evaluator never advanced to the point that "melt down" could be avoided. The preparation time to have a class of students use this program would be extensive even with student information sheets being prepared in the DISC workshop. It also moves very fast. It would be more effective if you could choose speeds to allow a longer time to learn. Even with manual set up, the computer timing does not change.

EVALUATION SUMMARY

| SA | A | D | SD | NA | |
|---|---|---|---|---|---|
| • | | | | | Content is accurate. |
| • | | | | | Content has educational value. |
| • | | | | | Content is free of stereotypes. |
| • | | | | | Purpose of package is well defined. |
| • | | | | | Package achieves defined purpose. |
| • | | | | | Content presentation is clear and logical. |
| | | • | | | Difficulty level is appropriate to audience. |
| • | | | | | Graphics/sound/color are used appropriately. |
| | • | | | | Use of package is motivational. |
| | • | | | | Student creativity is effectively stimulated. |
| | | • | | | Feedback is effectively employed. |

| SA | A | D | SD | NA | |
|---|---|---|---|---|---|
| | | • | | | Learner controls rate and sequence. |
| | | • | | | Instruction integrates with prior learning. |
| | • | | | | Learning can be generalized. |
| | • | | | | User support materials are comprehensive. |
| • | | | | | User support materials are effective. |
| • | | | | | Information displays are effective. |
| | | | | • | Users can operate easily and independently. |
| | | • | | | Teachers can employ package easily. |
| | • | | | | Computer capabilities are used appropriately. |
| | • | | | | Program is reliable in normal use. |

SA - Strongly Agree A - Agree D - Disagree SD - Strongly Disagree NA - Not Applicable

**Evaluators indicated they would use or recommend use of this package with little or no change.**

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## Dragon Mix

**Producer:** DLM, Inc.
P.O. Box 4000
Allen, TX 75002

**Evaluation Completed:** May 1983 by the staff and constituents of TIES, Roseville, Minnesota.
**Version:** 1982.
**Cost:** $39.00 for Apple, $44.00 for TI 99/4A.

**Ability Level:** Grades 3-7.
**Subject:** Mathematics.
**Topic:** Multiplication and division.
**Medium of Transfer:** 5¼" flexible disk.
**Required Hardware:** 48K Apple II or Apple IIe, disk drive, monitor (preferably color), game paddles (optional).
**Required Software:** Applesoft, DOS 3.3.
**Instructional Purpose:** Standard instruction, remediation.
**Instructional Techniques:** Drill and practice, game.

### Documentation Available

Suggested grade/ability level(s), instructional objectives, program operating instructions, teacher's information, student's instructions, student worksheets, and follow-up activities.

### Instructional Objectives

Following extensive drill with materials in this package, the student will be able to: correctly write or say answers to basic fact problems in package at a rate of 40 to 90 per minute with 100% accuracy; correctly compute basic facts included in the program within individual problems involving more complex processes; and correctly answer basic facts included in the program in applied situations such as making change and determining distances.

### Instructional Prerequisites

The program assumes that the student has been introduced to multiplication and division facts in the program prior to use.

### Content and Structure

The package consists of one disk in a hard plastic folder, a teacher's guide, worksheet and progress chart masters, and a set of flashcards in a box. The record-keeping is not on the disk, but rather in the form of progress charts. The program is drill and practice for multiplication and division facts 0-9. Students are involved in a game in which a dragon defends a city from attacking spacecraft. The level of difficulty and the time allowed are controlled by the teacher. At the end of each game, the hits and misses are reported. This information is then recorded by the student on a progress chart.

### Estimated Student Time Required

A student would need at least five to ten minutes per day over a period of several weeks to meet the objectives.

### Potential Uses

The package could be effectively used by individual students in a classroom for drill and practice on division and multiplication facts. If competition between students is desired, a race can be instigated by using more than one computer.

### Major Strengths

The game format is highly motivational. Graphics and sound are very effective. The student record-keeping can be motivational, as well as a learning experience in graphs. With teacher control of content and timing, the game is not easily mastered so there is a challenge for high achievers, as well as low-achievers.

### Major Weaknesses

The game takes a long time to boot. The teacher's guide and supplementary materials are not very helpful.

EVALUATION SUMMARY

| SA | A | D | SD | NA | |
|---|---|---|---|---|---|
| • | | | | | Content is accurate |
| • | | | | | Content has educational value |
| • | | | | | Content is free of stereotypes |
| • | | | | | Purpose of package is well defined |
| • | | | | | Package achieves defined purpose |
| | • | | | | Content presentation is clear and logical |
| | • | | | | Difficulty level is appropriate to audience |
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| SA | A | D | SD | NA | |
|---|---|---|---|---|---|
| | | | | • | Learner controls rate and sequence |
| | | • | | | Instruction integrates with prior learning |
| | • | | | | Learning can be generalized |
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| | | • | | | User support materials are effective |
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| | • | | | | Users can operate easily and independently |
| • | | | | | Teachers can employ package easily |
| | • | | | | Computer capabilities are used appropriately |
| • | | | | | Program is reliable in normal use |

SA - Strongly Agree A - Agree D - Disagree SD - Strongly Disagree NA - Not Applicable

Evaluators indicated that they would highly recommend this package.

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# ICCE Organization Members

**Alaska Association for Computers in Education (AACE)**
Contact: Sandra Burgess
Coordinator, The Northern Institute, 630 W. International Airport Rd., Anchorage, AK 99502

**Alberta Association for Educational Data Systems**
Contact: Keith Ayden
838 Education Tower, University of Calgary
2500 University Dr. NW, Calgary
Alberta, Canada T2N 1N4

**Arizona Computer Users in Education**
Contact: Nancy Watson
2148 Santa Drive
Tempe, AZ 85281

**Association for the Development of Computer-Based Instructional Systems (ADCIS)**
Contact: Dr. Gordon Hayes, Executive Director
ADCIS—Miller Hall 409, Western Washington University, Bellingham, WA 98225

**Computer Education Group of Victoria**
Contact: Leon Gurr, Conference Secretary
P.O. Box 245, Nuddine 3042
Melbourne, Victoria, Australia

**Computer Education Group of Queensland**
Contact: D.A. Carey
G.P.O. Box 1669
Brisbane, Queensland 4001
Australia

**Computer Education Society of Ireland**
Contact: Mary Devlin
85 Limetrees Road East, Douglas, Cork, Ireland

**Computer Educators of Idaho**
Contact: Dennis Dentmore
P.O. Box 1008, Hailey, ID 83333

**Computers, Learners, Users, Educators Association (CLUES)**
Contact: Henry J. Petersen, Executive Director
30 Nellis Drive, Wayne, NJ 07470

**Computer-Using Educators (California)**
Contact: Glenn Fisher
Alameda County Office of Education
School Computer Unit
685 "A" St., Hayward, CA 94541

**Computer-Using Educators of British Columbia (CUEBC)**
Contact: Barry Underwood
309 Alder St., Campbell River
B.C., Canada V9W 2S9

**Computer-Using Educators of Kentucky (CUE-KY)**
Contact: Janet Parker
EMCE Dept., School of Education
University of Louisville, Louisville, KY 40292

**EMEACOM**
Contact: Inno Broekman
Avenbroek 98, 2182 RZ Hillegom
The Netherlands

**Educational Computing Consortium of Ohio**
Contact: Ellen Richman, Coordinator
4777 Lombard Road, Cleveland, OH 44124

**Educational Computing Association of Western Australia**
Contact: P.C. Farrell, President
12 Lilac Place, Dianella 6062, Western Australia

**Educational Computing Organization of Ontario (ECOO)**
Contact: Robert E. Drake, President
252 Bloor Street West, Toronto
Ontario, Canada M5S 1V6

**Educational Microcomputer Users Group of Central New York (EMUGCNY)**
Contact: Jane McGoban
Roxboro Middle School, Mattydale, NY 13211

**Educators Interest Group of the San Diego Computer Society**
Contact: Melvin L. Zeddies
P.O. Box 81537, San Diego, CA 92138

**Florida Association of Science Teachers (FAST)**
Contact: Richard Sweetser
1147 Scatten Rd., Jacksonville, FL 32205

**Illinois Association for Educational Data Systems (IAEDS)**
Contact: Lyle B. Smith, President
Computer Science Department, Northern Illinois University, Box 128, De Kalb, IL 60115

**Indiana Computer Educators**
Contact: David A. Flowers
Ft. Wayne Community Schools, Adm. Ctr.
1230 So. Clinton St., Ft. Wayne, IN 46802

**Manitoba Association for Educational Data Systems (MAN-AEDS)**
Contact: Ed Buiatsha, Secretary-Treasurer
1577 Wall Street, East Winnipeg, Manitoba
Canada R3E 2S5

**Michigan Association for Computer Users in Learning (MACUL)**
Contact: Larry R. Smith, Communications Sec.
13500 Van Born Road, Wayne, MI 48184

**Minnesota Association for Educational Data Systems**
Contact: Sue Tacey
1925 W. County Rd. B2, St. Paul, MN 55113

**Montana Council for Computers in Education**
Contact: Leon Roland
1846 Bitterroot
Billings, MT 59105

**National Institute for Microcomputer Based Learning (NIMBL)**
Contact: Stanley Wherman, President
148 Plymouth Ave., Brightwaters, NY 11718

**New Hampshire Association for Computer Education Statewide (NHACES)**
Contact: Anne Knight, President
University of New Hampshire, Computer Services, Durham, NH 03824

**New York State Association for Educational Data Systems**
Contact: Don Ross, President
Ardsley High School, 800 Farm Road
Ardsley, NY 10502

**New South Wales Computer Education Group**
Contact: Tom Downes, Chairperson
P.O. Box 148, Broadway, N.S.W. 2007 Australia

**Northwest Council for Computer Education (Oregon, Washington and Northern Idaho)**
Contact: Howard Bailey
Computing Center, Eastern Oregon State College
La Grande, OR 97850

**Oklahoma Educational Computer Users Program (OECUP)**
Contact: Richard V. Andree
Department of Mathematics, 601 Elm St., #423
The University of Oklahoma, Norman, OK 73019

**Pennsylvania Learning Resources Association (PLRA)**
Contact: George H. Zook, Director, IMS
Lancaster-Lebanon I.U. #13
P.O. Box 5026, Lancaster, PA 17601

**Quebec Association of Computer Users in Education**
Contact: Don Rosenbaum, Membership Director
P.O. Box 369, Ormstown, Quebec, J0S 1K0
Canada

**Saskatchewan Association for Computers in Education**
Contact: Duncan Campbell
Mt. Royal Collegiate, 2220 Rusholme Road
Saskatoon, Saskatchewan, Canada S7L 4A4

**The Science Teachers' Association of Ontario**
Contact: Warren Sirs
1032 Harkness Ave., Oshawa, Ontario
Canada K1V 6P2

**Society of Data Educators (SDE)**
Contact: Robert Behling
Bryant College, Smithfield, RI 02917

**Society for Microcomputing in Life & Education (SAMLE)**
Contact: Hillel Weintraub, President
Doshisha International High School
Tatara, Tanabe-cho, Tsuzuki-gun
Kyoto-fu, Japan 610-03

**Texas Computer Education Association**
Contact: Vicki S. Smith
P.O. Box 2571, Austin, TX 78762

**The Utah Council for Computers in Education**
Contact: Dr. Larry C. Christensen
1295 North 1200 West, Mapleton, UT 84663

**Wyoming Educational Computing Council**
Contact: Robert L. Morrisette, President
Laramie County School District #1, Admin. Bldg.
2810 House Ave., Cheyenne, WY 82001

**Young People's LOGO Association (YPLA)**
Contact: James H. Muller
1208 Hillsdale Drive, Richardson, TX 75081

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